Cedar River and Bear Creek Chinook

Abundance and Survival-to-Emigration into Lake Washington of the 2000 Brood

Dave Seiler and
Greg Volkhardt

Wild Stock Production Evaluation Unit

Chinook Escapement

Cedar River – AUC Method

Year	Esc.
2001:	810
2000:	120
1999:	241
1998:	432

Bear Creek – AUC Method

2001:	459	►	690
2000:	228	►	332
1999:	537	►	732
1998:	265	►	398

Contributors

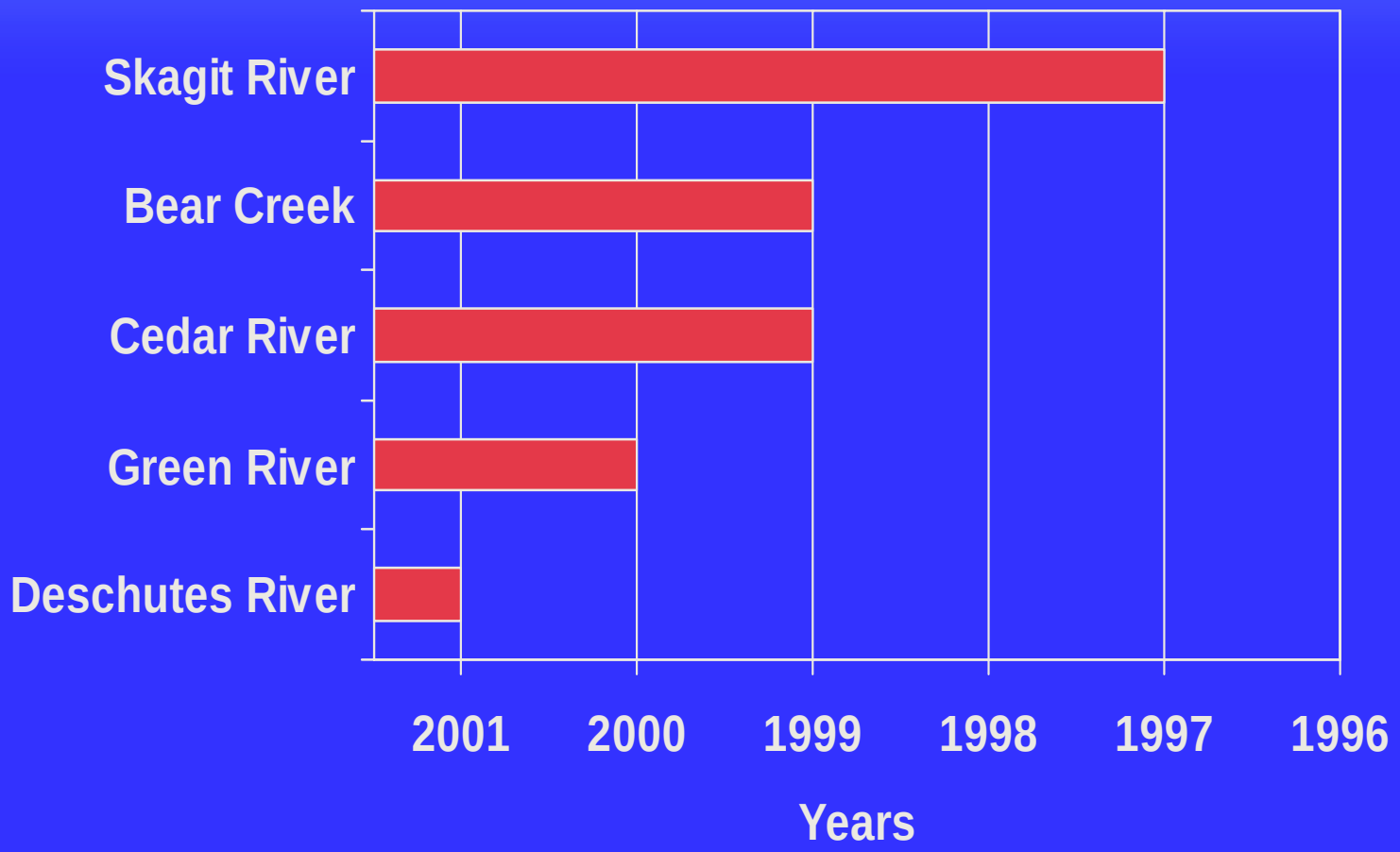
Steve Foley – WDFW

King County

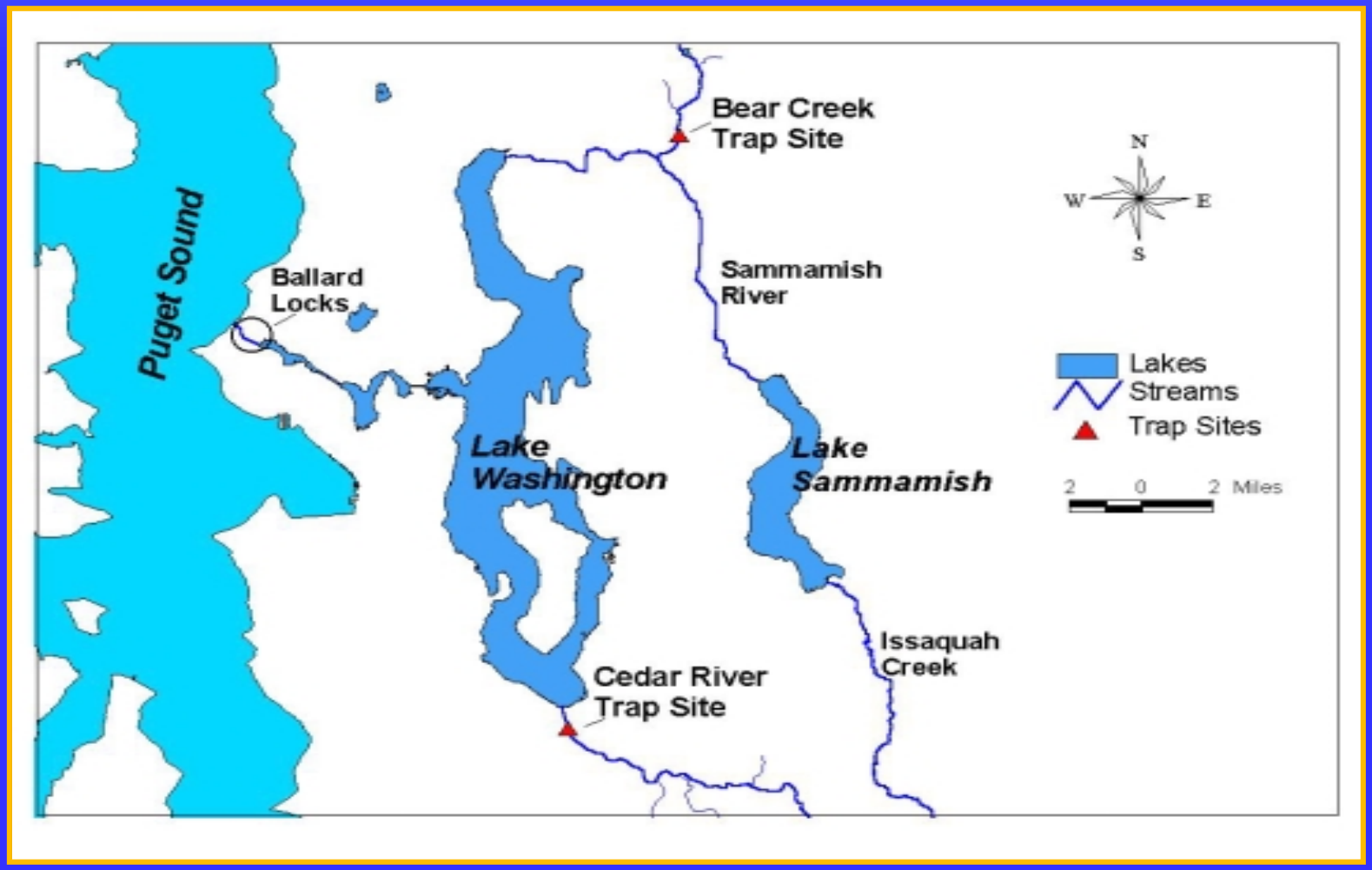
Muckleshoot Tribe

City of Seattle

Juvenile Chinook Production Monitoring



Location Map of the Cedar River and Bear Creek Trap Sites

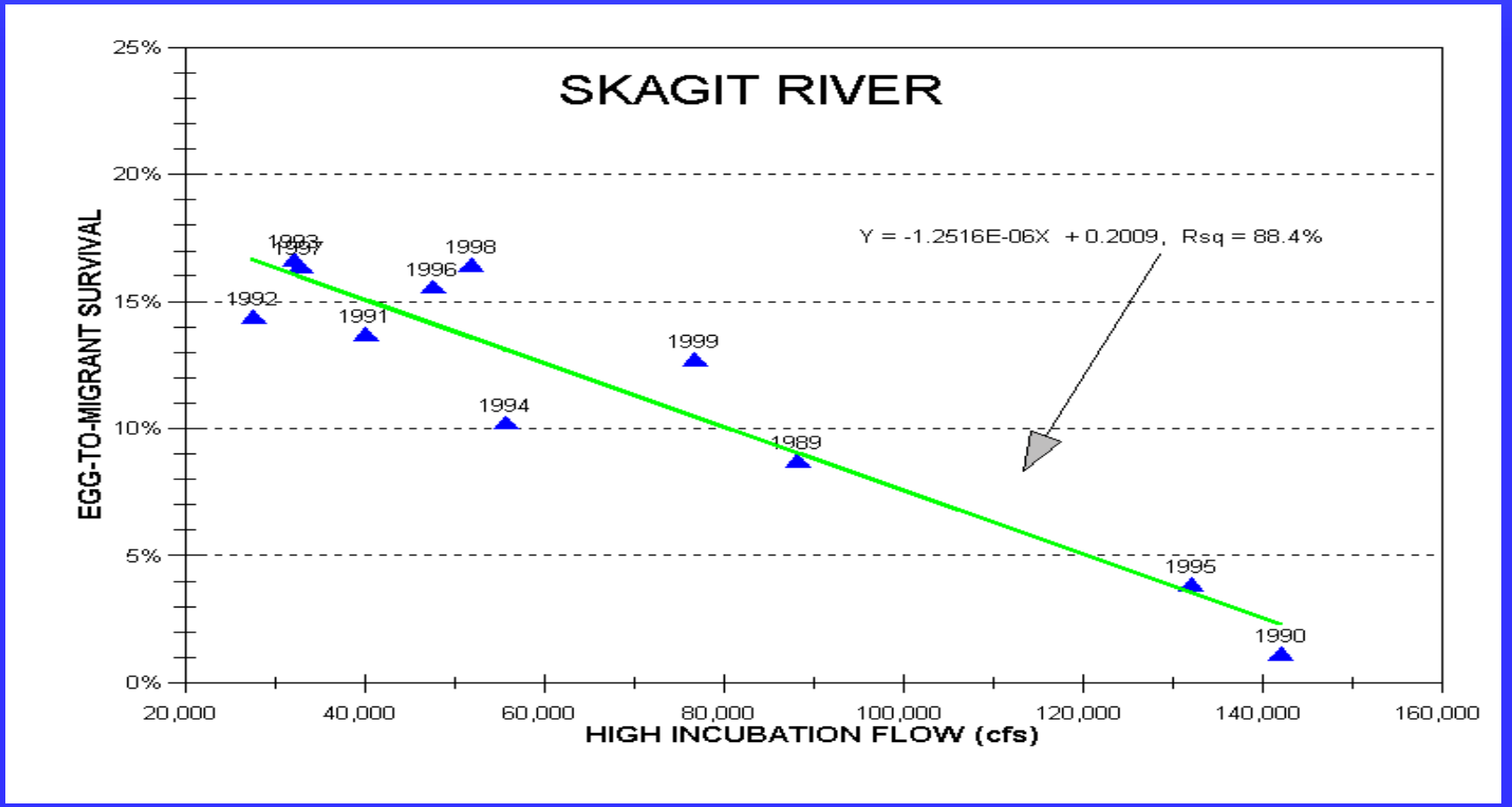


Cedar River

Big Bear Creek

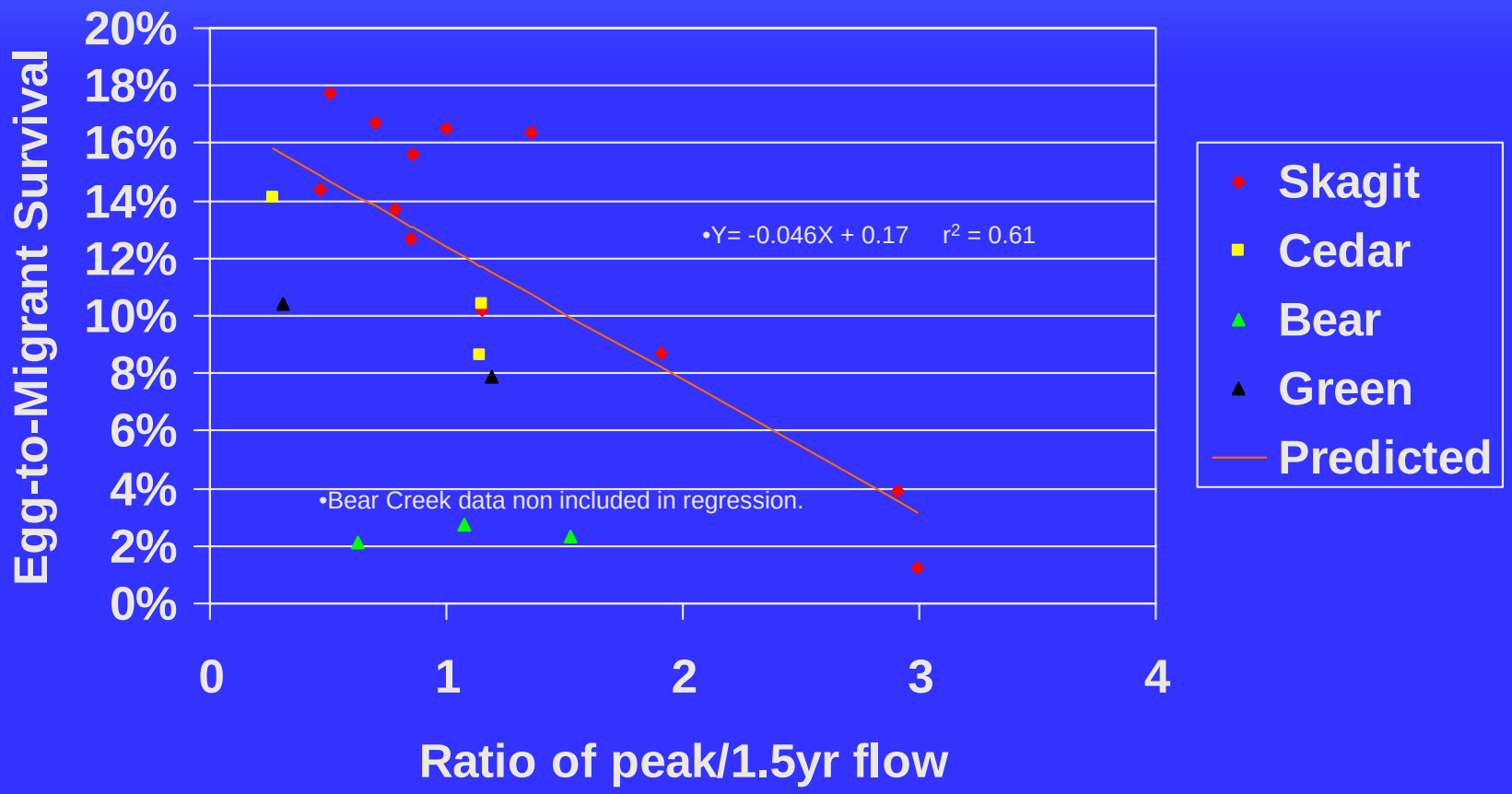
Incubation Success

- It's a function of peak flow -



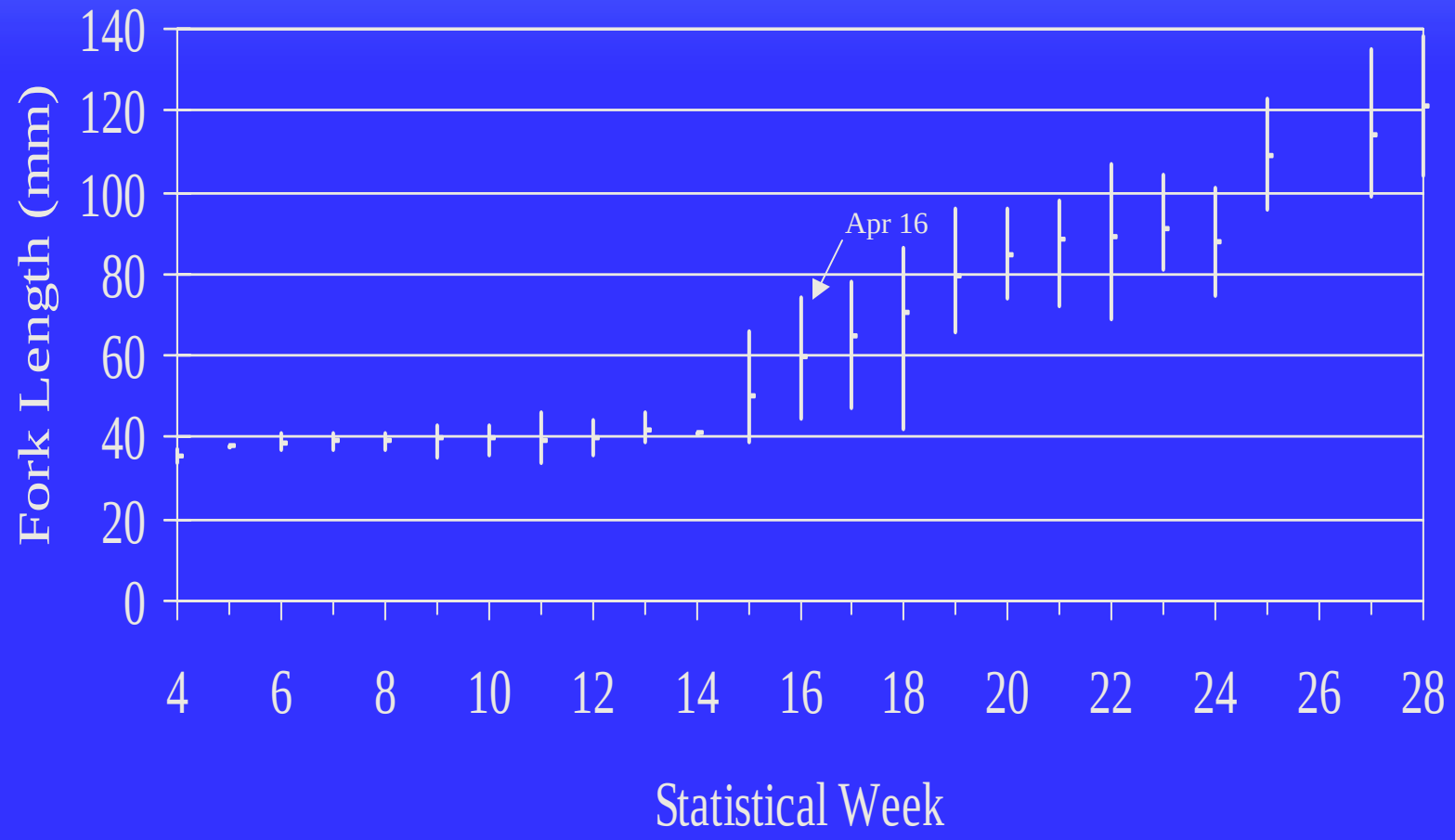
Incubation Success

- It's a function of peak flow -

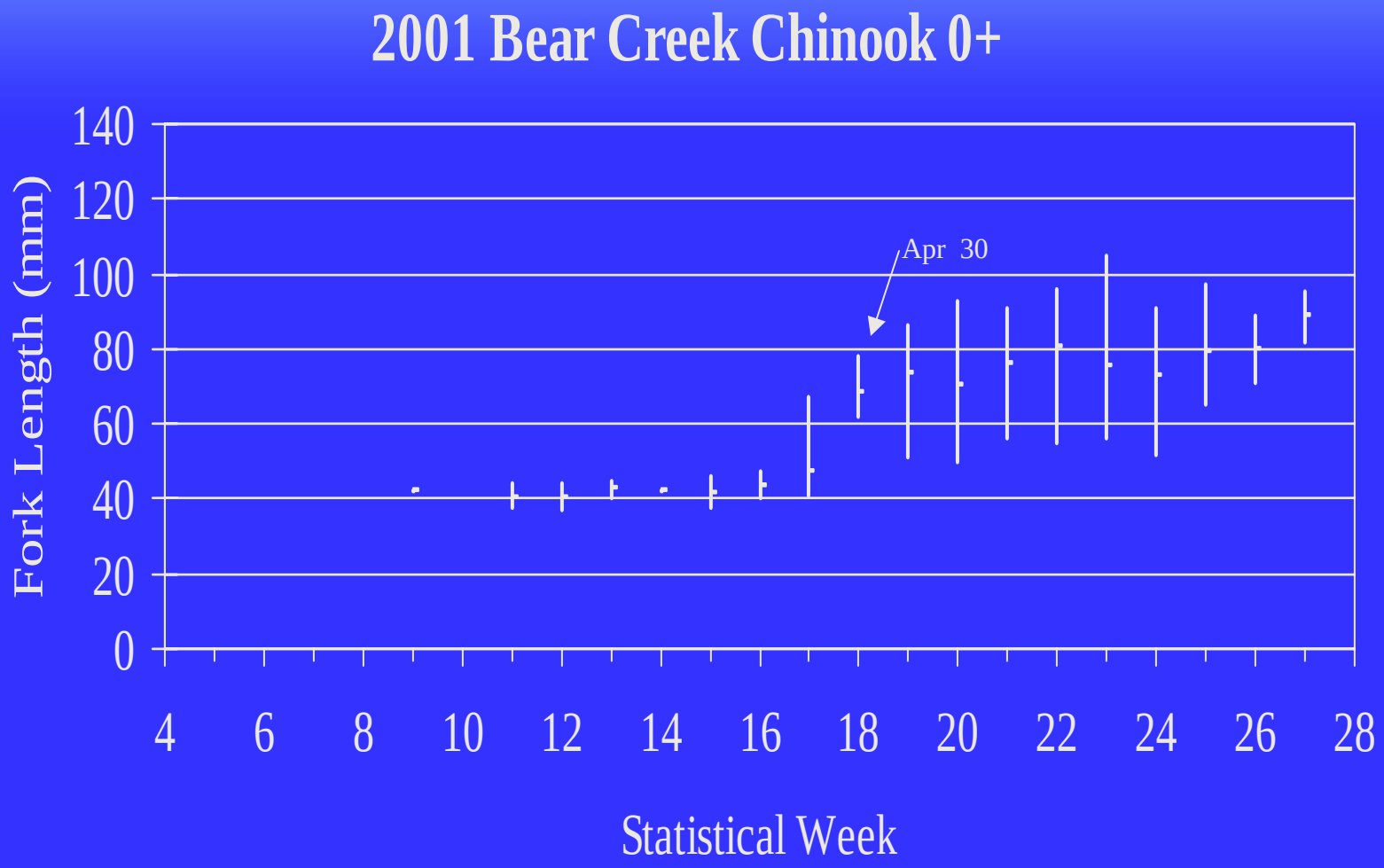


Incubation Timing

2001 Cedar River Chinook 0+



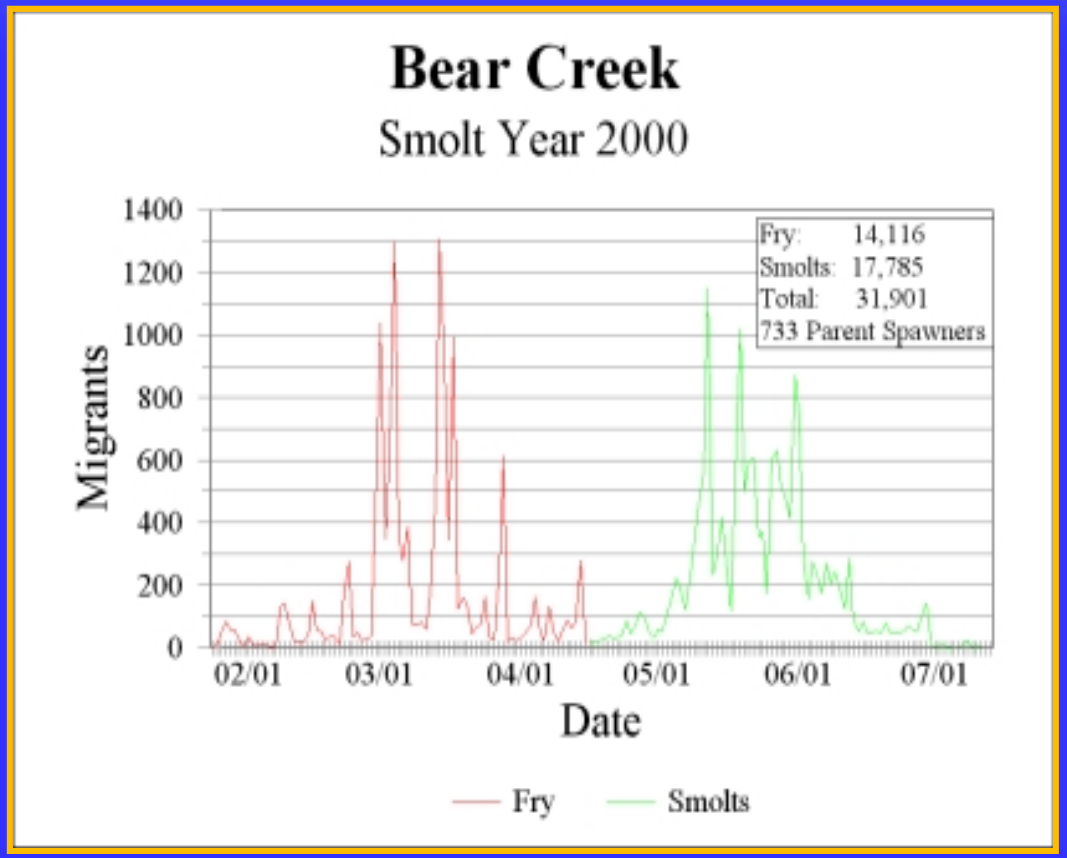
Incubation Timing



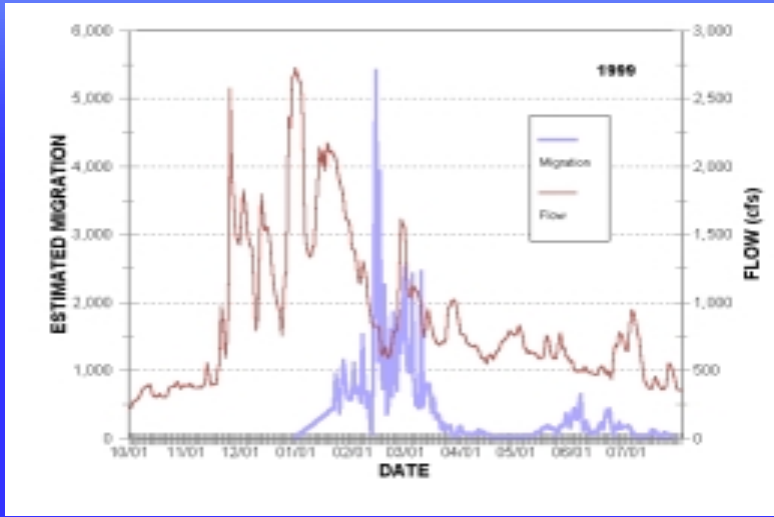
Early Rearing and Migration

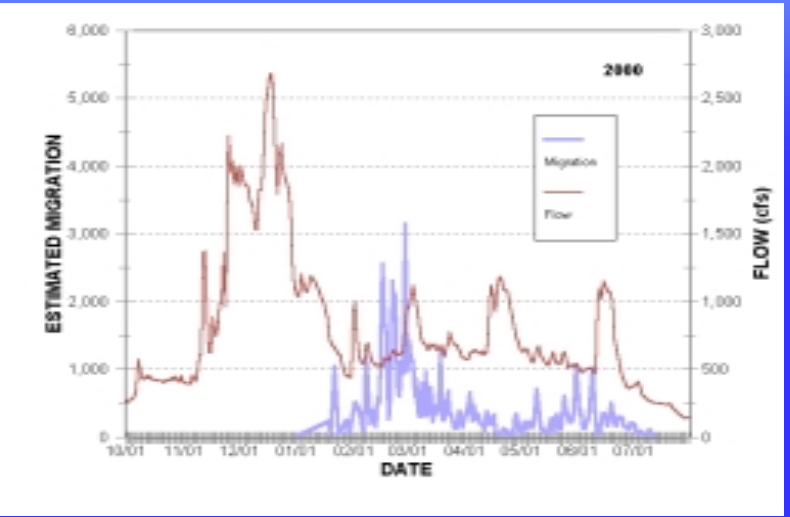
Bi-modal migration timing

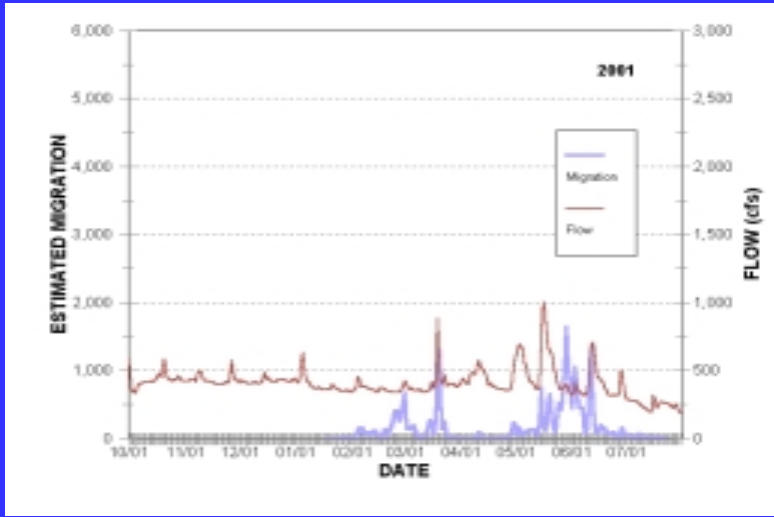
- "Fry" migration from January to mid-April
- "Smolt" migration from mid-April to July
- Different proportions between years



Cedar River Wild Chinook





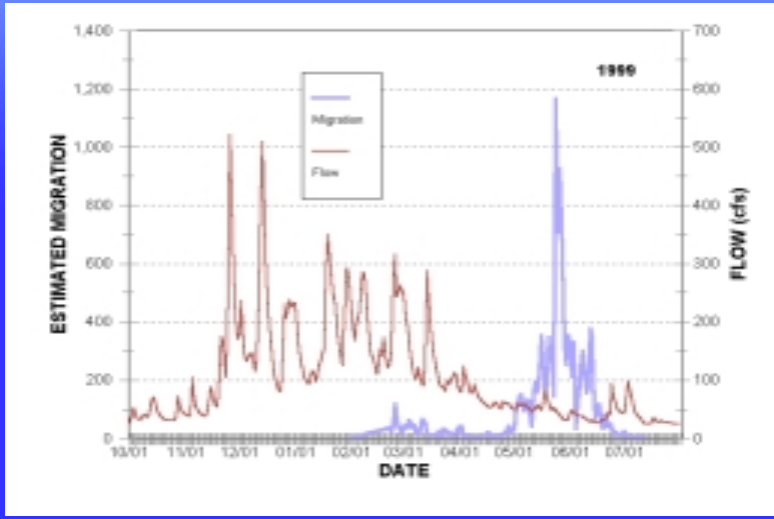


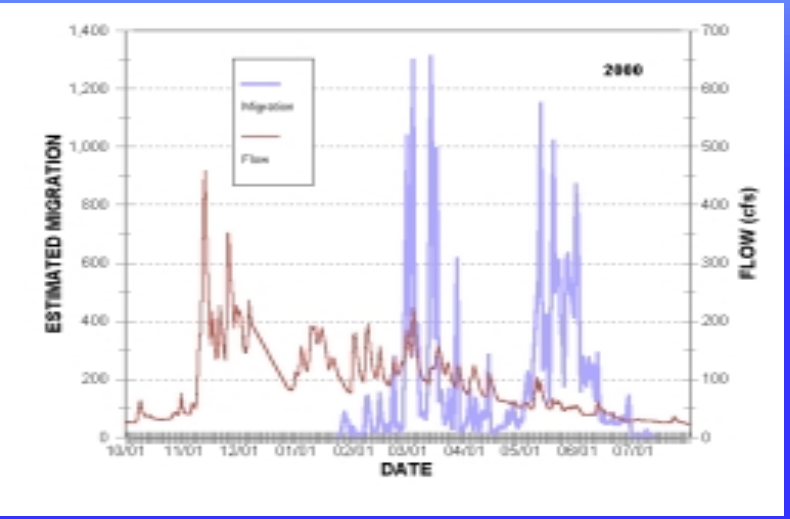
1999 – High flows/velocities push most of the production downstream as "fry". Low "smolt" production.

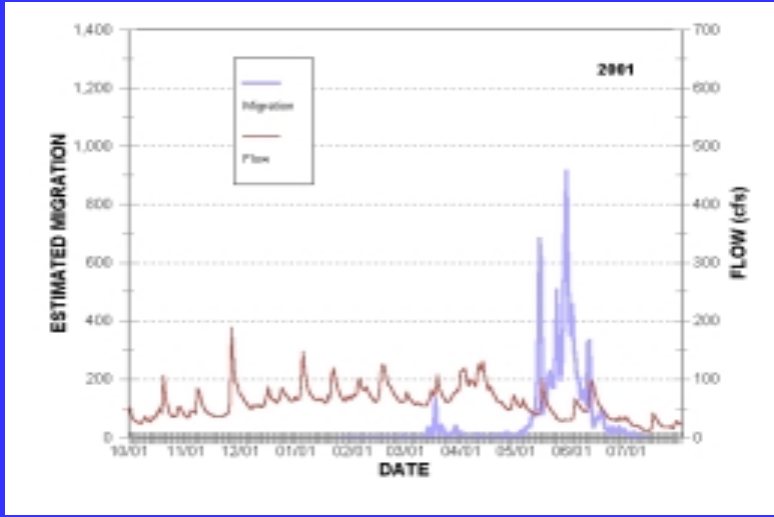
2000 – Moderate-high flows/velocities results in higher "smolt" production than observed in 1999.

2001 – Extreme low flows result in the largest "smolt" production measured. Low escapement (120) and predation contributed to the low number of total migrants.

Bear Creek Wild Chinook







1999 – Lower stream energy in Bear Creek results in high proportion of smolts even with high flow levels.

2000 – Good escapement (732) results in a higher proportion of fry being displaced downstream.

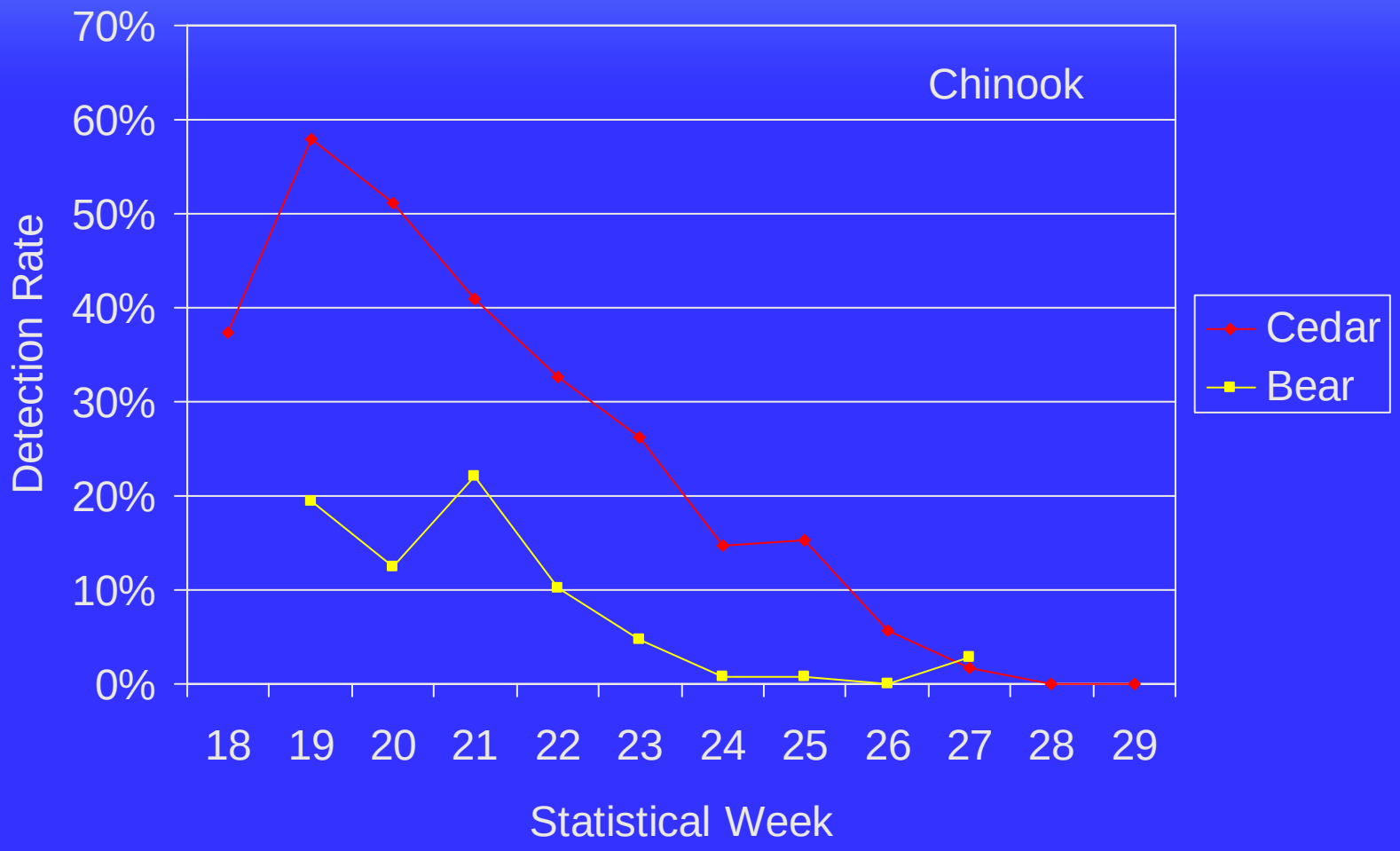
2001 – Factors such as low flow and stream energy providing an advantage to predators as well as high sockeye spawner abundance resulted in the lowest total production measured.

Cedar & Bear Chinook - Estimated production, timing, and survival to fry and smolts stages

Cedar River											
Smolt Year (I)	Estimated Migration			Percent Migration		Est Female (I-1)	Production/Female		Survival Ratios		
	Fry	Smolts	Total	Fry	Smolts		Fry	Smolts	Fry/ PED	Smolts/ PED	Total
1999	67,336	12,454	79,790	84%	16%	232	290	54	7.3%	1.3%	8.6%
2000	54,836	19,860	74,696	73%	27%	180	305	110	7.6%	2.8%	10.4%
2001	9,427	20,200	29,627	32%	68%	53	178	381	4.5%	9.5%	14.0%
Bear Creek											
Smolt Year (I)	Estimated Migration			Percent Migration		Est Female (I-1)	Production/Female		Survival Ratios		
	Fry	Smolts	Total	Fry	Smolts		Fry	Smolts	Fry/ PED	Smolts/ PED	Total
1999	1,720	13,207	14,927	12%	88%	159	11	83	0.3%	2.1%	2.4%
2000	14,116	17,785	31,901	44%	56%	293	48	61	1.2%	1.5%	2.7%
2001	541	10,616	11,157	5%	95%	133	4	80	0.1%	2.0%	2.1%

PIT Tagging Studies

Survival through the Lake



Survival through the Lake